KENWOOD

GRAPHIC EQUALIZER

GE-970

INSTRUCTION MANUAL

KENWOOD CORPORATION

When you play a music source while this unit is connected to your system, always turn the power of this unit ON regardless of whether you use the graphic equalizer functions or not. (The audio signal reproduced by the source playback component is sent to the amplifier by passing through this unit. Therefore, the music source cannot be listened to unless the power of this unit is ON.)

B60-1388-00 (JA) (SI) (E, T, M, X) [G]
94/12 11 10 9 8 7 6 5 4 93/12 11 10 9 8 7 6

Introduction

Your choice of this product indicates that you are a devotee to excellence in sound reproduction.
We appreciate your patronage and take pride in the long tradition of quality components that our company represents.
So that you can get the most out of your unit, we suggest that you take the time to read through this manual before you hook up and operate your system. This will acquaint you with operating features and system-connection considerations so that your listening pleasure will be enhanced right from the start.
You will notice that in all aspects of planning, engineering, styling, operating convenience and adaptability we have sought to anticipate your needs and desires.
Keep this manual handy for future reference.

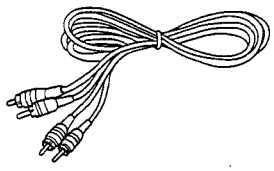
For your records

Record the serial number, found on the back of the unit, in the spaces designated on the warranty card, and in the space provided below. Refer to the model and serial numbers whenever you call upon your dealer for information or service on this product.
Model_____ Serial Number_____

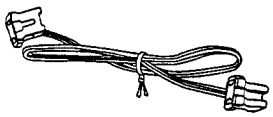
Unpacking

Unpack the unit carefully and make sure that all accessories are put aside so they will not be lost.
Examine the unit for any possibility of shipping damage. If your unit is damaged or fails to operate, notify your dealer immediately. If your unit was shipped to you directly, notify the shipping company without delay. Only the consignee (the person or company receiving the unit) can file a claim against the carrier for shipping damage.
We recommend that you retain the original carton and packing materials for use should you transport or ship the unit in the future.

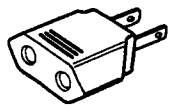
Audio cord 3



System control cord 1



AC plug adaptor 1
(except for U.K., Australia and Europe)
For the unit with a European AC plug in areas other than Europe.



Contents

Caution: Read the pages marked ⚠ carefully to ensure safe operation.

Introduction 2
⚠ Before applying power 3
⚠ Safety precautions 3
⚠ IMPORTANT SAFEGUARDS 4
System connections 6
Controls and indicators 7
Operation of graphic equalizer 8
Contents of display 9
Character display 9
Demonstration procedure 10
Operation of AI AUTO (for CD play only) 10
Operation of AI FOCUS (for CD play only) 11
Storing optimum equalizer curve (AI FILE) 12
Playback by recalling a stored equalizer curve (AI FILE) 12
Operation of MANUAL/REFERENCE feature 13
Equalizer pattern list 14
Fine adjustment of each frequency band (Graphic mode) 15
User-preset of user-created pattern (M-1 to M-5) 15
How to use the REC MODE key 16
Bass Compensation 16
Surround Modes and presence modes 18
Speaker layout 19
DOLBY SURROUND 20
Dolby Surround field adjustment 20
Operation of Dolby Surround playback 21
DOLBY 3 STEREO 22
DOLBY 3 STEREO adjustment 22
DOLBY 3 STEREO playback 22
Presence 23
Presence playback 23
Combination of presence and environmental sound (F. 4ch only) 24
To turn presence effect OFF 25
To record with presence effect 25
Let's sing 26
Regular MIC MIXING 26
Using HIT MASTER 26
Singing with echo 27
Song Recording 27
In case of difficulty 28
⚠ Specifications 28

Before applying power

⚠ **Caution: Read this page carefully to ensure safe operation.**

For the U.S.A. and Canada

Important!

Units shipped to the U.S.A. and Canada are designed for operation on 120 volts AC only.

For Australia and Europe

Important!

Units shipped to Australia are designed for operation on 240 V AC only.

Units shipped to Europe are designed for operation on 230 V AC only.

For the United Kingdom

Important!

Units shipped to the U.K. are designed for operation on 240 volts AC only.

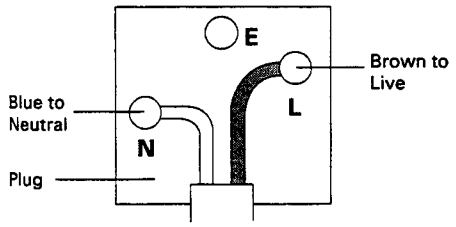
The mains plug must be removed from the wall socket prior to any internal examination.

The wires in this mains lead are coloured in accordance with the following code:

Blue ..... Neutral
Brown ..... Live

The wires in this mains lead must be connected to the terminals in the plug as follows:

Wire colour	**Plug terminal marking**
Blue	N or Black
Brown	L or Red



Notes:

1. If a 13-amp plug is used, this must be fitted with a 13-amp fuse.
2. If a 3-pin plug with earthing contact is used, no wire must be connected to the E terminal.

For other countries

Important!

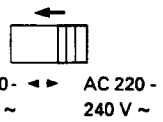
Units shipped to countries other than the above countries are equipped with an AC voltage selector switch on the rear panel. Refer to the following paragraph for the proper setting of this switch.

AC voltage selection

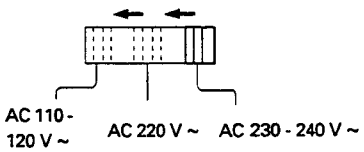
This unit operates on 110 - 120 or 220 - 240 volts AC. The AC voltage selector switch Type A or Type B on the rear panel is set to the voltage that prevails in the area to which the unit is shipped. Before connecting the power cord to your AC outlet, make sure that the setting position of this switch matches your line voltage. If not, it must be set to your voltage in accordance with the following direction.

AC voltage selector switch

Type A



Type B



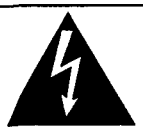
Move switch lever to match your line voltage with a small screwdriver or other pointed tool.

Note:

Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC voltage selector switch.

Safety precautions

WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

	CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
	THE LIGHTNING FLASH WITH ARROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS.
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE.

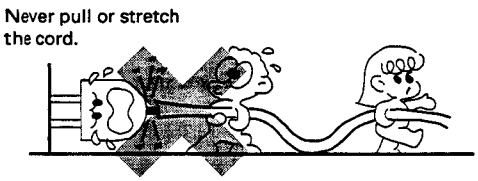
IMPORTANT SAFEGUARDS

⚠ **Caution: Read this page carefully to ensure safe operation.**

Please read all of the safety and operating instructions before operating this appliance. Adhere to all warnings on the appliance and in the instruction manual. Follow all the safety and operating instructions. These safety and operating instructions should be retained for future reference.

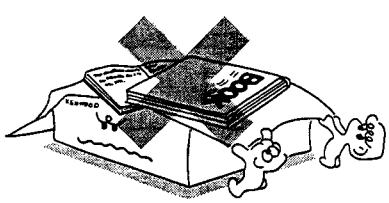
1. **Power sources** – The appliance should be connected to a power supply only of the type described in the instruction manual or as marked on the appliance. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For appliances intended to operate from battery power, or other sources, refer to the instruction manual.

2. **Power-cord protection** – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.



3. **CAUTION – Polarization** – This appliance may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety future. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

4. **Ventilation** – Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the appliance and to protect it from overheating, and these openings must not be blocked or covered. The appliance should be situated so that its location or position does not interfere with its proper ventilation.
   To maintain good ventilation, do not put records or a table-cloth on the appliance. Place the appliance at least 10 cm away from the walls.
   Do not use the appliance on a bed, sofa, rug or similar surface that may block the ventilation openings. This appliance should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

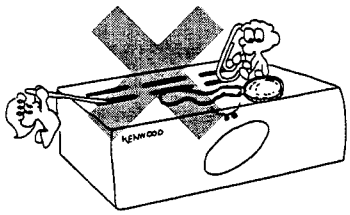


5. **Water and moisture** – The appliance should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

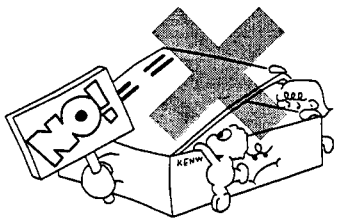
6. **Temperature** – The appliance may not function properly if used at extremely low, or freezing temperatures. The ideal ambient temperature is above +5°C (41°F).

7. **Heat** – The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

8. **Electric shock** – Care should be taken so that objects do not fall and liquid is not spilled into the enclosure through openings. If a metal objects, such as a hair pin or a needle, comes into contact with the inside of this appliance, a dangerous electric shock may result. For families with children, never permit children to put anything, especially metal, inside this appliance.



9. **Enclosure removal** – Never remove the enclosure. If the internal parts are touched accidentally, a serious electric shock might occur.



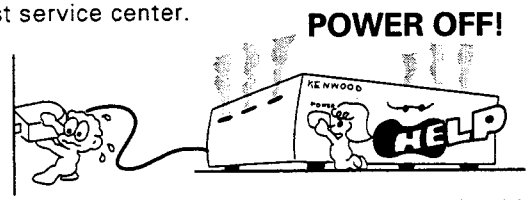
10. **Magnetic fields** – Keep the appliance away from sources of magnetic fields such as TV sets, speaker systems, radios, motorized toys or magnetized objects.

11. **Cleaning** – Unplug this appliance from the wall outlet before cleaning. Do not use volatile solvents such as alcohol, paint thinner, gasoline, or benzine, etc. to clean the cabinet. Use a clean dry cloth.

12. **Accessories** – Do not place this appliance on an unstable cart, stand, tripod, bracket, or table. The appliance may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the appliance. Any mounting of the appliance should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

13. **Lightning** – For added protection for this appliance during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the appliance due to lightning and power-line surges.

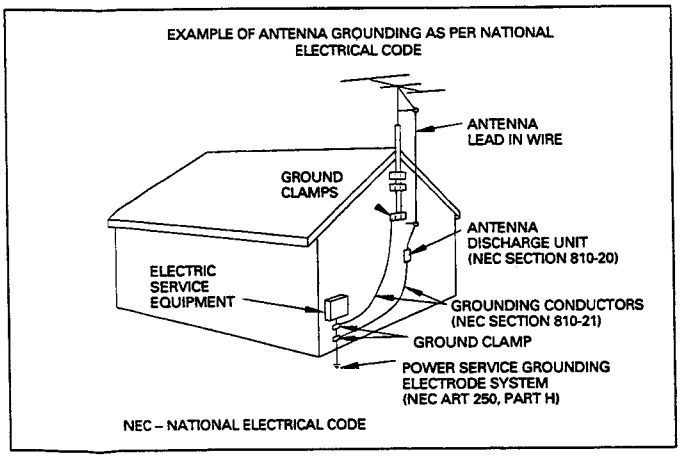
14. **Abnormal smell** – If an abnormal smell or smoke is detected, immediately turn the power OFF and unplug the appliance from the wall outlet. Contact your dealer or nearest service center.



15. **Damage requiring service** – The appliance should be serviced by qualified service personnel when:
A. The power-supply cord or the plug has been damaged.
B. Objects have fallen, or liquid has been spilled into the appliance.
C. The appliance has been exposed to rain or water.
D. The appliance does not appear to operate normally by following the instruction manual. Adjust only those controls that are covered by the instruction manual as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the appliance to its normal operation.
E. The appliance has been dropped, or the enclosure damaged.
F. The appliance exhibits a marked change in performance.

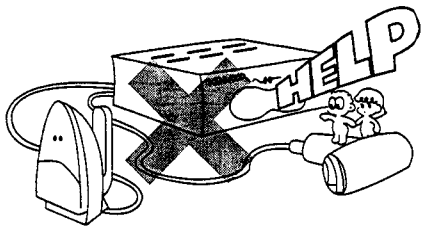
16. **Servicing** – The user should not attempt to service the appliance beyond that described in the instruction manual. All other servicing should be referred to qualified service personnel.

17. **Outdoor antenna grounding** – If an outside antenna is connected to the appliance, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges. Article 810 of the National Electrical Code ANSI/ NFPA 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure.


EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE
ANTENNA LEAD IN WIRE
GROUND CLAMPS
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMP
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250, PART H)
NEC – NATIONAL ELECTRICAL CODE

18. **Power lines** – An outside antenna system should not be located in the vicinity of overheated power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

19. **AC outlets** – Do not connect other audio equipment with a power consumption larger than that specified to the AC outlet on the rear panel. Never connect other electrical appliances, such as an iron or toaster, to it to prevent fire or electric shock.



20. **Overloading** – Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

21. **Attachment** – Do not use attachments not recommended by the appliance manufacturer as they may cause hazards.

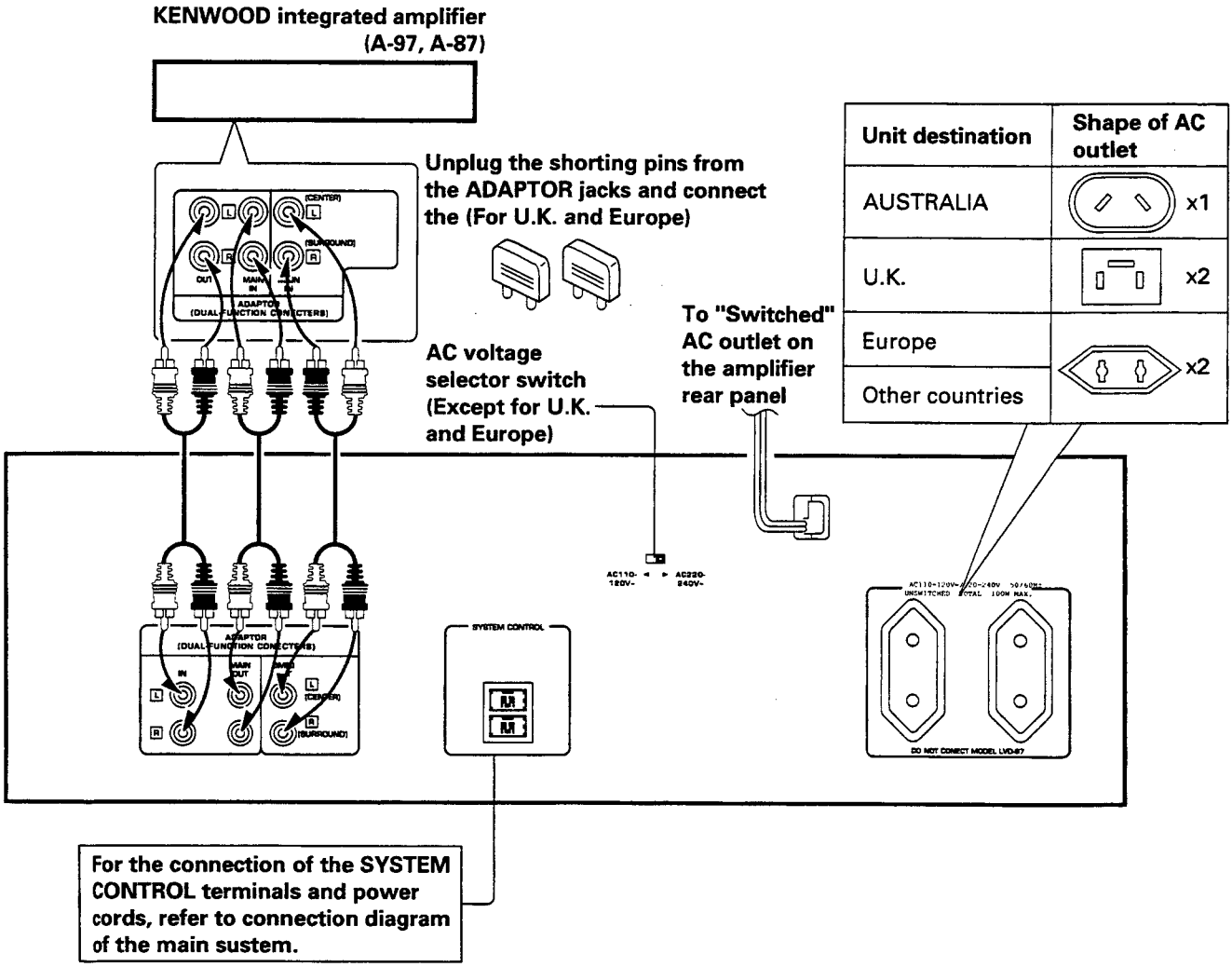
22. **Replacement parts** – When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

23. **Safety check** – Upon completion of any service or repairs to this appliance, ask the service technician to perform safety checks to determine that the appliance is in proper operating condition.

Notes:
1. Item 3 is not required except for grounded or polarized equipment.
2. Item 17 and 18 are not required except for units provided with antenna terminals.
3. Item 17 complies with UL in the U.S.A.

System connections

Make connection as shown below. When connecting the related system components, refer also to the instruction manuals of the related components.
Do not plug in the power lead until all connections are completed.


KENWOOD integrated amplifier
(A-97, A-87)
Unplug the shorting pins from the ADAPTOR jacks and connect the (For U.K. and Europe)
AC voltage selector switch (Except for U.K. and Europe)
To "Switched" AC outlet on the amplifier rear panel
Unit destination
Shape of AC outlet
AUSTRALIA
x1
U.K.
x2
Europe
Other countries
x2
SYSTEM CONTROL
For the connection of the SYSTEM CONTROL terminals and power cords, refer to connection diagram of the main sustem.

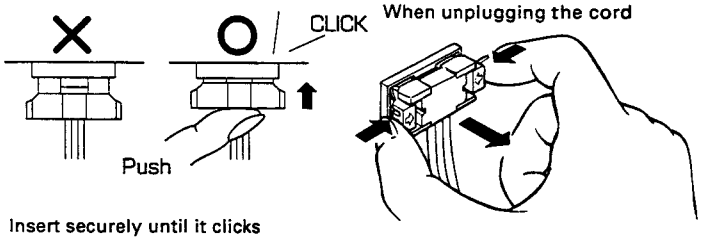
- Do not connect other amplifier than the KENWOOD A-97 and A-87 amplifier to the ADAPTOR (DUAL-FUNCTION CONNECTERS) jacks.
- Do not connect the LVD-97 to the AC OUTLET on the rear panel. (For the K-99LD system.)

System control connection

When connected to the main system, system operation such as remote control is made possible. For details, refer to the instruction manual of the main system.

If your amplifier or receiver is not equipped with the SYSTEM CONTROL terminals, do not connect anything to any SYSTEM CONTROL terminal.

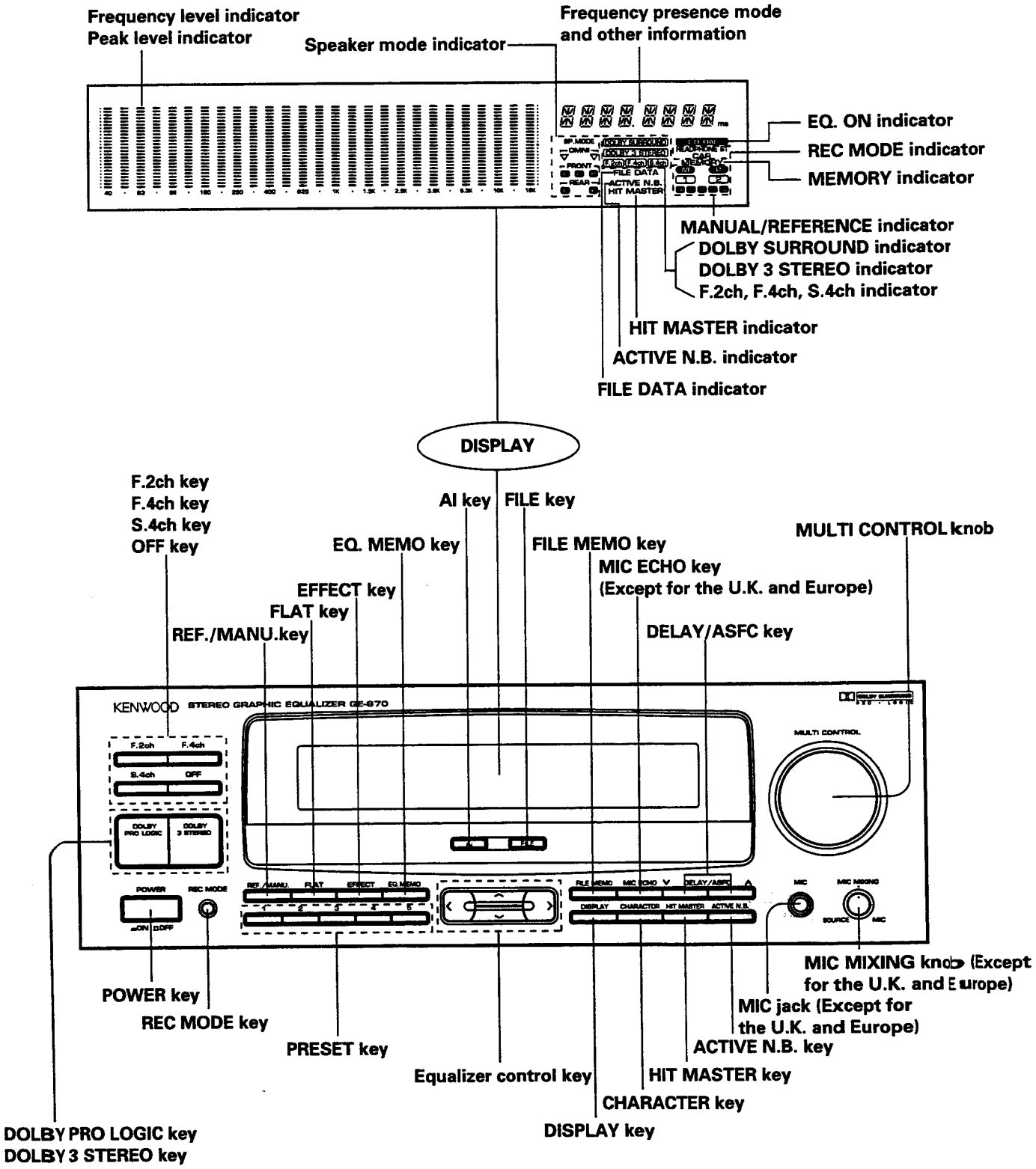
Do not connect the unit in any system configuration other than specified.



- Be sure to insert the system control cord plugs fully into the SYSTEM CONTROL terminals.
- If the system control cord and audio cords are not connected properly, the automatic system governing remote control and system functions will not operate.

Notes:
1. Connect all cords firmly. If connections are loose, there could be loss of sound or noise produced.
2. When plugging and unplugging connection cords, be sure to first remove the power cord from the AC outlet. Plugging/unplugging connection cords without removal of the power cord can cause malfunctions or damage to the unit.
3. Do not connect up a power source which is larger than that indicated on the socket at the rear of the unit.

Controls and indicators



Operation of graphic equalizer

This unit is a near-professional type graphic equalizer which allows fine adjustments of frequency bands. It not only provides acoustic compensation for the characteristics of your listening room, but also reproduces each music source with adequate tone using the following AI (Artificial Intelligence) features.

1. DEMO (Demonstration)
   Displays various equalizer curves visually in sequence together with the actual sound effect of each curve as an audible demonstration.

2. AI-AUTO (available only for CD play)
   When playing a CD with the presence effect OFF, checks the contents recorded on the CD automatically, and sets the optimum equalizer pattern and LINEAR ACOUSTIC control knob on the amplifier (A-87, A-97) according to the CD. (Refer to page 10.)

3. AI-FOCUS (available only for CD play)
   When playing a CD with the presence effect ON, checks the contents recorded on the CD with respect to the presence mode selected, and sets the optimum equalizer pattern and ASFC setting and LINEAR ACOUSTIC control knob on the amplifier (A-87, A-97) according to the CD and the presence mode selected.
   (For the ASFC (Acoustic Surround Field Control), refer to page 25.)

4. AI-LINK (available for all input sources)
   When the presence mode is selected, optimum equalizer curve for this mode is selected automatically to enhance the presence effect. The LINEAR ACOUSTIC control knob on the amplifier (A-87, A-97) is set automatically according to the selected sound field.

5. AI FILE (available only for CD play)
   The equalizer curve set with the AI feature and the balance set with the LINEAR ACOUSTIC control of the amplifier can be stored for up to 60 Compact Discs. When a CD with its data stored in the AI File is played, this function makes the time of AI setting (about 30 seconds) unnecessary. If a presence mode (F.2ch, F.4ch, S.4ch) is selected, the optimum ASFC (the setting factor determining the sound expansion) is also set automatically.

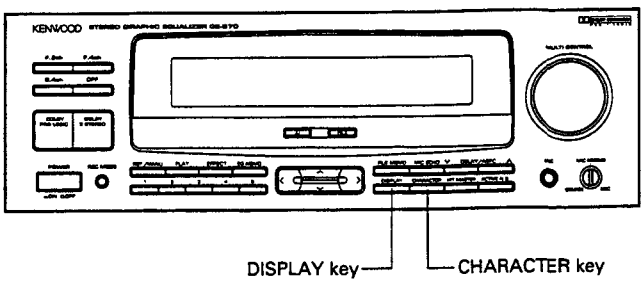
6. MANUAL/REFERENCE modes
   REFERENCE: Ten exemplary patterns have been preset at the factory. (Refer to page 14.)
   MANUAL: Five preset patterns have been factory-preset for this mode, too. In this mode, it is also possible to preset (assign) equalizer patterns created by the user in place of the factory presets.

7. CHARACTER
   In the spectrum analyzer display mode, the level of the music being played and changes of frequency distribution with four different patterns are displayed.

SPE. ANA	1: NORMAL	Normal spectrum analyzer display
	2: SHOWER	Reversed normal spectrum analyzer display with the normal peak hold levels display
	3. HORIZONTAL	Displays right and left levels with the frequency band in vertical axis and level in horizontal axis.
	4: SEE-THROUGH	Displays peak and peak hold levels only.
ANIMATION		Displays various patterns regardless of the freguency or level.

8. REC MODE (For car stereo, headphone stereo)
   The equalizer pattern displayed is also applied to the sound recorded on tape. In addition, a recording equalizer curve "CAR", which records sound so that optimum balance is obtained when the tape is played on a car stereo, and recording equalizer curve "HEADPHONE ST.", which records sound so that optimum balance is obtained when the tape is played on a headphone stereo, are provided. By selecting one of these two REC MODES together with an equalizer pattern of AI-AUTO or MANUAL/REFERENCE, both effects can be applied to the recording, so that the tape simulates the sound of a listening room through a car stereo or headphone stereo. (Refer to page 16.)

AI: Artificial Intelligence. The AI is capable of adjusting the tone automatically according to the source and music categories.



Contents of display

The display mode changes every time the [DISPLAY] key is pressed.

- During recording on the cassette deck, this key switches only between the graphic equalizer display and spectrum analyzer display.

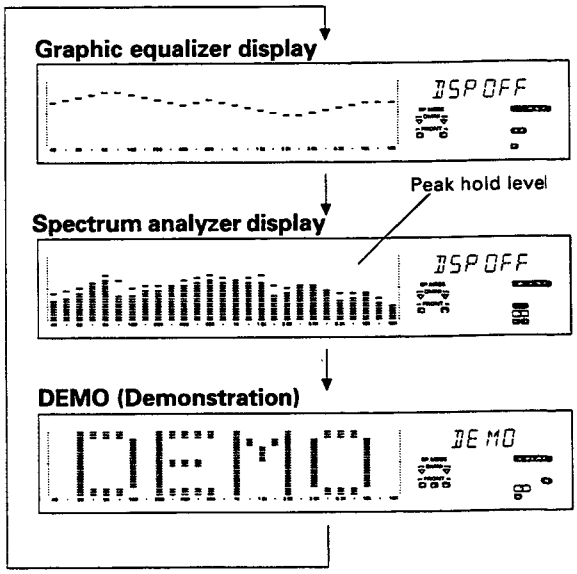
Graphic equalizer display

Shows how each frequency range is compensated.
The graphic equalizer display also appears for about 5 seconds, even while the unit is in the spectrum analyzer display mode, when one of the following operations is performed.

1. Switching power ON.
2. An operation key associated with an equalizer operation is pressed.

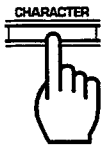
Spectrum analyzer display

Displays the frequency distribution of the source being played to allow understanding at a glance.
The peak value of the varying level of each frequency range is held and displayed for about 0.5 seconds.

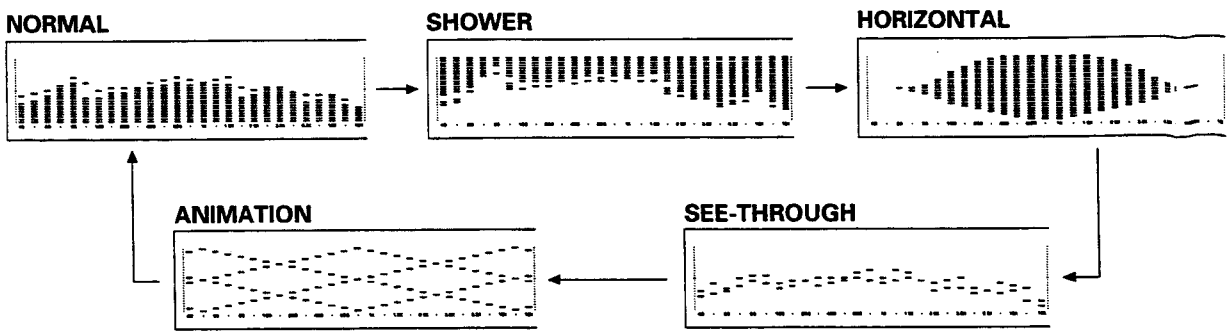


Character display

Press the [CHARACTER] key during the spectrum analyzer display mode.



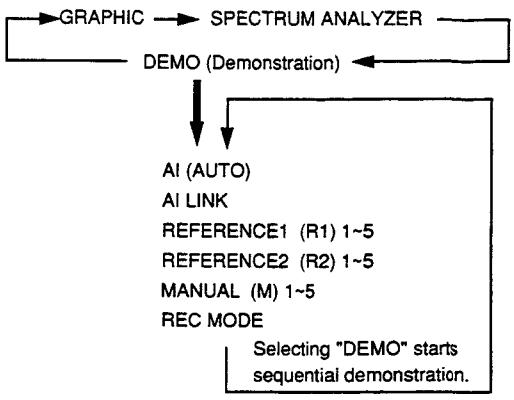
The display mode changes every time the [CHARACTER] key is pressed.



■ Demonstration procedure

This feature makes it possible to check the equalizer effects both visually and audibly.

① Select an input source.



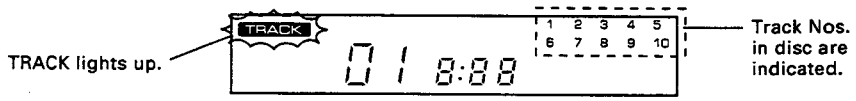
② Play the source.
③ Select DEMO with the DISPLAY key.
④ Demonstration is repeated in the following cycle.

- Press the [DISPLAY] key to stop demonstration.
- During AI LINK demonstration, the Surround mode also changes.
- If the demonstration is started while the unit is in the Surround mode, the Surround mode will be turned OFF during demonstration.

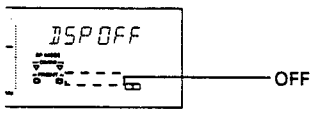
■ Operation of AI AUTO (for CD play only)

When playing a CD with the presence effect OFF, the equalizer curve suitable for a specific disc is set automatically by simply pressing the AI key.

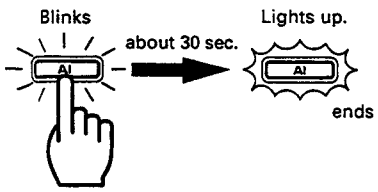
1 Place a disc in the CD player.

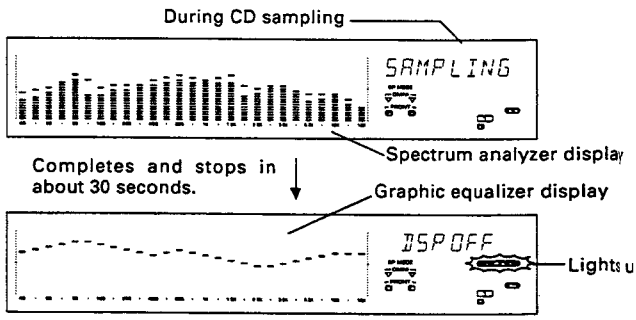


Check that the presence mode is OFF.



2 Press the AI key.



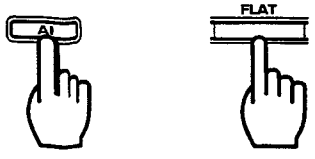


- Wait for about 30 seconds until [EQ.ON] and [AI] light up.
- The LINEAR ACOUSTIC control knob on the amplifier (A-87, A-97) is set automatically.

The playback starts automatically.

Note:
In step 2, the other keys than the [AI] and the [POWER] key do not operate.

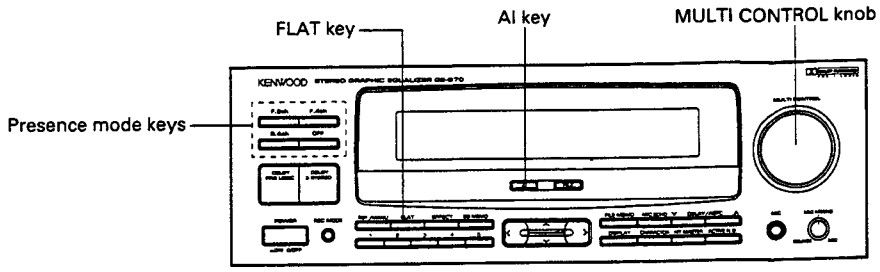
To cancel AI AUTO



Cancellation during setting

Cancellation during play

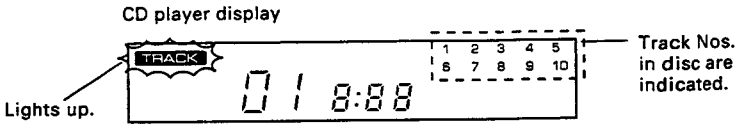
- [AI] goes off.
- If it is cancelled during AI AUTO setting operation, the last pattern selected before is displayed.
- AI AUTO is canceled also when the disc tray is opened.



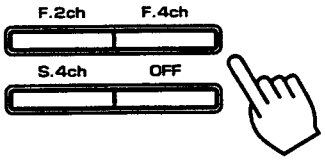
■ Operation of AI FOCUS (for CD play only)

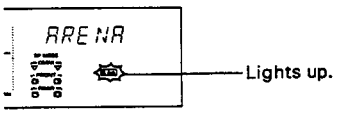
When playing a CD with the presence effect ON, the delay time, presence volume (reverberation level) and equalizer curve are set automatically by simply pressing the AI key.

1 Place a disc in the CD player.

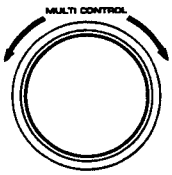


2 Select the desired presence mode.

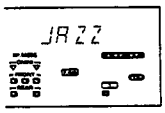




3 Select a sound field.

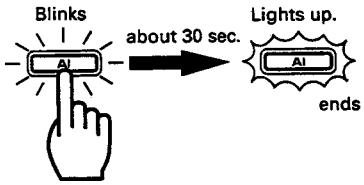


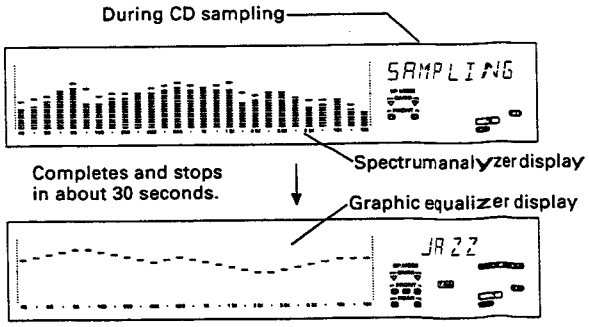
Mode name display



4 Press the AI key.

- The ASFC (Acoustic Surround Field Control) and an equalizer pattern are set according to the presence mode selected.
- The LINEAR ACOUSTIC control knob of the amplifier (A-87, A-97) is set automatically according to the selected sound field.
- Wait for about 30 seconds until EQ.ON and AI light up.
- Playback starts automatically.

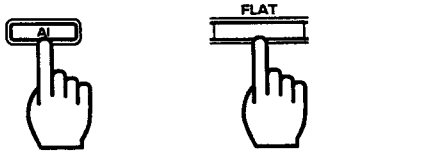




Note:
In Step 4, the other keys than the AI and the POWER key do not operate.

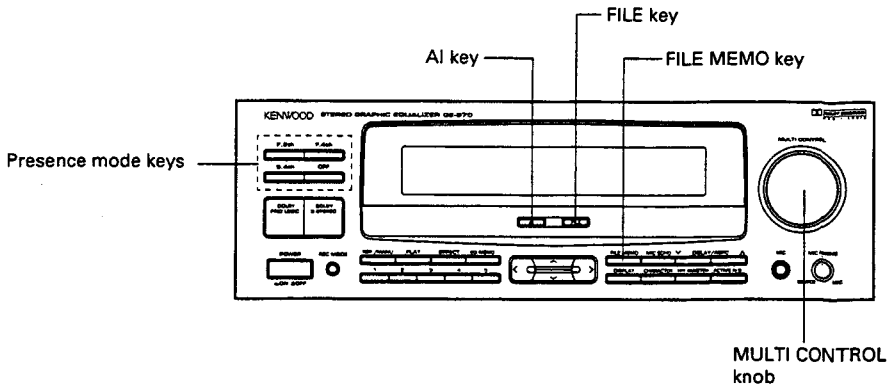
To cancel AI FOCUS

- AI goes off.
- If it is cancelled during AI FOCUS setting operation, the last pattern selected before is displayed.
- AI FOCUS is cancelled also when the disc tray of the CD player is opened.



Cancellation during setting

Cancellation during play



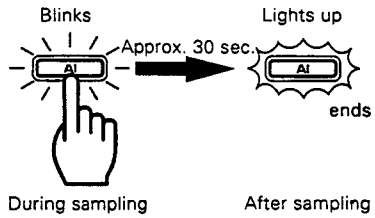
■ Storing optimum equalizer curve (AI FILE)

The graphic equalizer curves set with the AI can be stored in memory for up to 60 discs. When a CD with its data stored in the AI File is played, it is not necessary to wait the AI setting because these settings are recalled automatically.

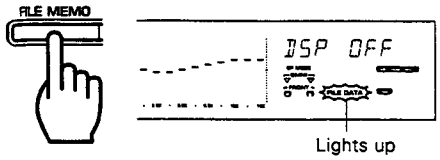
1 Place a disc in the CD player.

2 Press the AI key.

The optimum equalizer curve is selected in about 30 seconds.



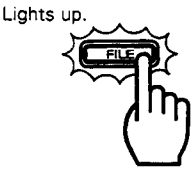
3 Press the FILE MEMO key.



- The equalizer curves set with the AI feature can be stored.
- Data of up to 60 CDs can be stored. When data of the 61st disc is stored, the data of the CD with the least frequency of use is cleared. (By checking the last time each data was used, the data which has not been used for the longest period of time is cleared.)

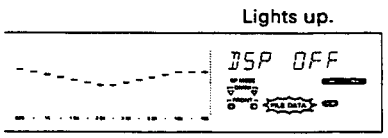
■ Playback by recalling a stored equalizer curve (AI FILE)

1 Press the FILE key.



- Keep the FILE key OFF when it is not required to recall the AI FILE data.

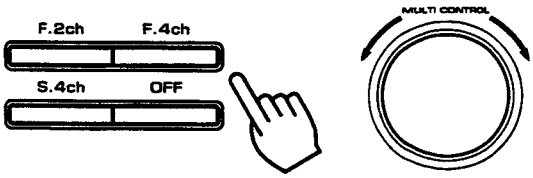
2 Place a CD with already stored data.



- The FILE DATA indicator lights when CD the data of which has already been stored is placed and the tray is closed.

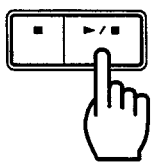
To play with a presence mode, also select the presence mode.

① Select a mode. **② Select a sound field.**

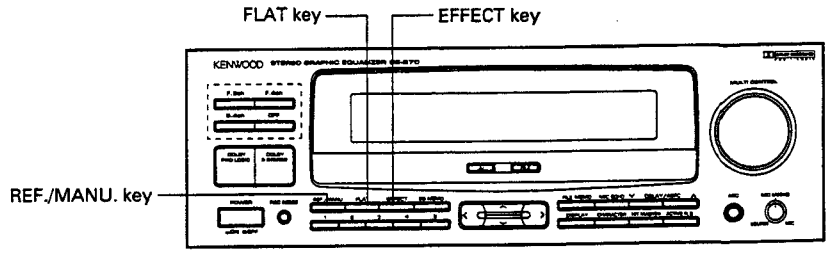


3 Play the disc.

The stored equalizer curve is recalled and the playback starts.



- If a presence mode has been selected, the ASFC (the setting factor determining the sound expansion) is also set automatically.
- The optimum LINEAR ACOUSTIC control balance (the balance of volume between the main and omnidirectional speakers) is also set automatically.



■ Operation of MANUAL/REFERENCE feature

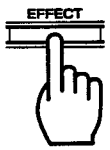
This feature makes it possible to recall one of fifteen preset equalizer patterns in a simple manner.
The equalizer patterns of the MANUAL mode (M-1 to M-5) are mainly for use in playback with Surround effect.

1 **Select an input source on the amplifier.**

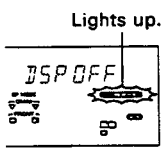
Remote control unit

2 **Play the music source.**

3 **Press the EFFECT key.**

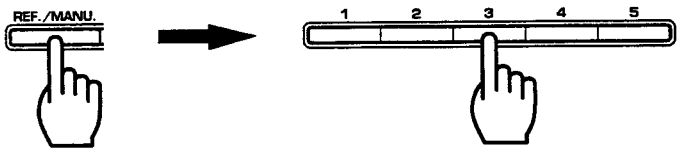


Remote control unit

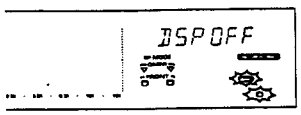


4 **Select an equalizer pattern.**

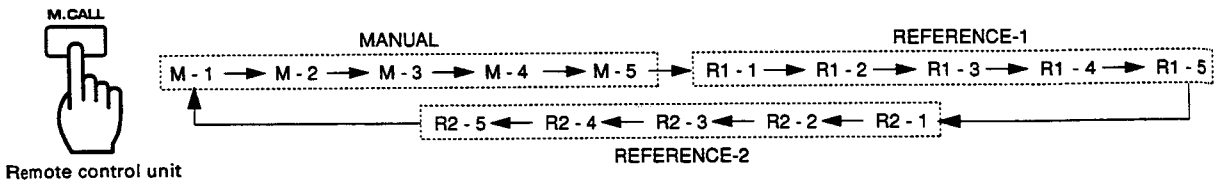
① **Set to MANUAL or REFERENCE 1, 2.**



② **Press the key for the desired pattern. (Refer to the equalizer pattern list on page 14).**



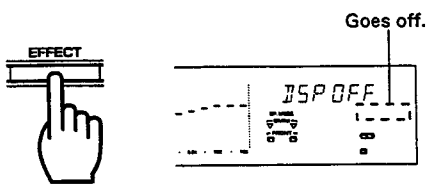
Example when "3" is selected in the MANUAL mode.



Remote control unit

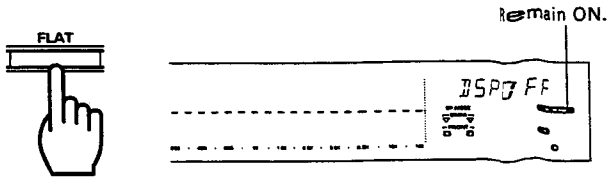
Patterns are switched every time the [M. CALL] key is pressed.

To cancel the equalizer effect



- The pattern being displayed remains the same.

How to use FLAT key



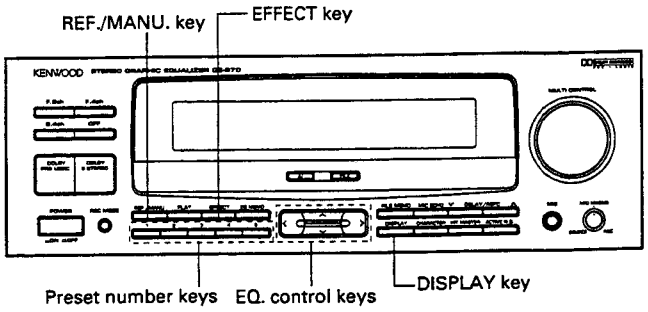
- Pressing the [FLAT] key flattens the curve.

■ Equalizer pattern list

15 kinds of preset equalizer patterns can be recalled easily.Select the optimum pattern.

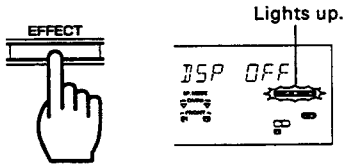
REFERENCE 1 (R1-1 to 5) equalizer patterns	
R1-1	(Popular, Fusion) Makes the fusion music or the vocal of pop music distinct while providing optimum compensation for the low and high frequencies.
R1-2	(Rock) Makes the vocal of rock music distinct while providing optimum compensation for the low and high frequencies.
R1-3	(Jazz) Makes the midrange frequencies in jazz music, including the vocal, piano and sax distinct, while providing optimum compensation for the low and high frequencies.
R1-4	(Classic) Provides well, balanced classical music by compensating the low, midrange and high frequencies.
R1-5	(Movie) Makes the dialogue distinct while providing optimum compensation for the low and high frequencies.
REFERENCE 2 (R2-1 to 5) equalizer patterns	
R2-1	(Popular, Fusion) Reproduces crisp sound with distinct vocal and enhanced low and high frequencies.
R2-2	(Rock) Reproduces powerful sound with distinct vocal and enhanced low and high frequencies of the bass, guitar and drums.
R2-3	(Jazz) Makes the vocal, piano and sax more distinct while providing powerful, full bass and drum sound by enhancing the low and high frequencies.
R2-4	(Classic) Reproduces dynamic sound with a full scale through heavy low, powerful midrange and unrestrained high frequencies.
R2-5	(Movie) Makes the dialogue distinct while enhancing the low and high frequencies for a powerful sound with full atmosphere of presence.

MANUAL (M-1 to M-5) equalizer patterns **User-set curves can be stored in this mode.**	
M1	(Popular, Fusion) Makes the fusion music or the vocal of pop music distinct while making the low and high frequencies clear by enhancing them.
M2	(Rock) Makes the vocal of rock music distinct and enhanced the low and high frequencies.
M3	(Jazz) Makes the jazz vocal and drums distinct, while making the low and high frequencies clear by enhancing them.
M4	(Classic) Attenuates the low frequencies and enhanced the midrange and high frequencies to provide wind instruments and vocals with unrestrained sound.
M5	(Movie) Makes the dialogue distinct by attenuating the low and high frequencies. Also reduces noise in old movies, etc.

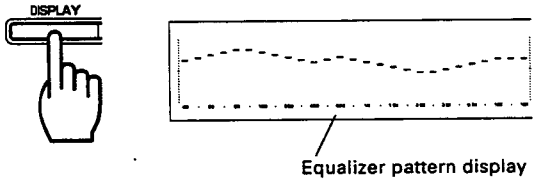


■ Fine adjustment of each frequency band (Graphic mode)

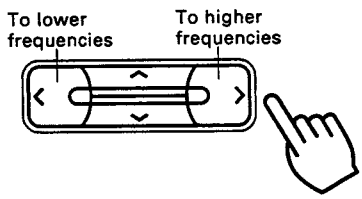
1 **Press the EFFECT key to set the equalizer to ON.**



2 **Select the graphic mode.**

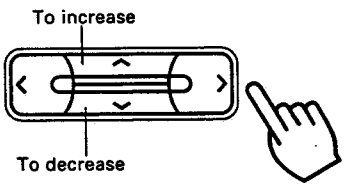


3 **Select the frequency band to be adjusted.**



Press the EQ. control keys.

4 **Adjust its level.**



Press the EQ. control keys.

5 **For each frequency band to be adjusted, repeat steps 3 and 4 above.**

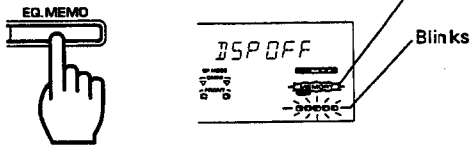
■ User-preset of user-created pattern (M-1 to M-5)

1 **Create a desired equalizer pattern.**

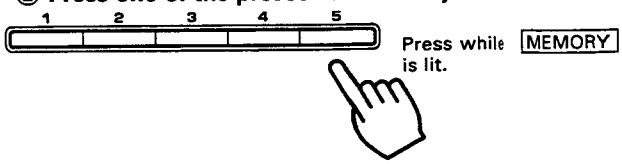
- Any equalizer pattern can be preset if it is being displayed.
- The pattern cannot be preset during operation of AI AUTO or AI FOCUS.

2 **Preset the equalizer pattern in the manual memory.**

① **Press the EQ. MEMO key.**



② **Press one of the preset number keys.**

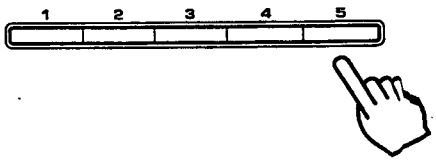


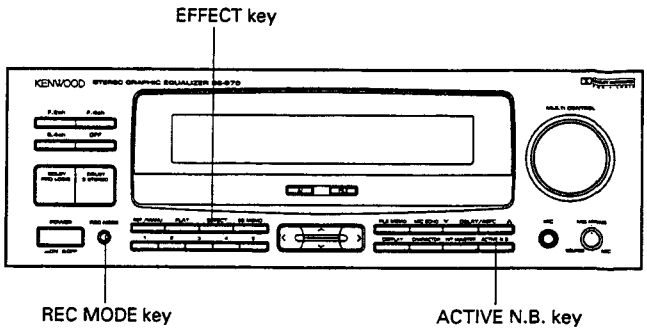
- Pattern is preset under the number of the numeric key pressed.
- Up to five patterns can be preset in the same manner.
- When a pattern has previously been preset under the numeric key pressed, the newly preset pattern replaces the previous pattern.

To return to the initial pattern (factory-preset patterns M-1 to M-5 on page 13) by clearing the user-preset pattern.

① **Select the MANUAL mode.**

② **Press the preset key where the pattern to be cleared is preset for more than 5 seconds.**

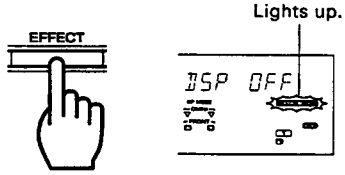




■ How to use the REC MODE key

Use the following function when recording tapes to be played on a car stereo or headphone stereo.

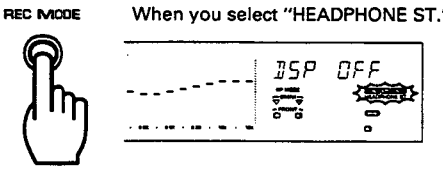
1 Press the EFFECT key to set the equalizer to ON.



2 Select an input source and the desired curve.

- Refer to page 10 to 15.

3 Select a REC MODE.



Each press switches the modes.

CAR (Recording for car stereo) → HEADPHONE ST. (Recording for head phone stereo) → OFF (Curve before pressing REC MODE) → CAR

- The pattern for car stereo recording or headphone stereo recording is combined with the currently-selected equalizer pattern.
- Select OFF (indicator extinguished) when the unit is used as an ordinary equalizer or for general recording for other tapes than those played on a car stereo or a headphone stereo.

4 Play a music source and start recording.

- Refer to the Instruction Manual of the main system.

To cancel the REC MODE

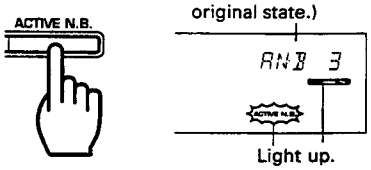
Press the key to select OFF (indicator goes off).

- The display shows the curve before synthesis again.

■ Bass Compensation

Example: selected mode 3

(After approx. 5 seconds the display returns to the original state.)



Display:

ANB 1 → ANB 2 → ANB 3 → Goes off (OFF) → ANB 1

Each press switches the modes in order.

ACTIVE N.B.: Active Natural Bass Circuit

- The bass compensation mode is switched over every time the key is pressed. Select the desired mode.
- When the ACTIVE N.B. key is ON, even if the display is showing the spectrum analyzer display, it changes to the graphic equalizer display whener the equalizer pattern changes.

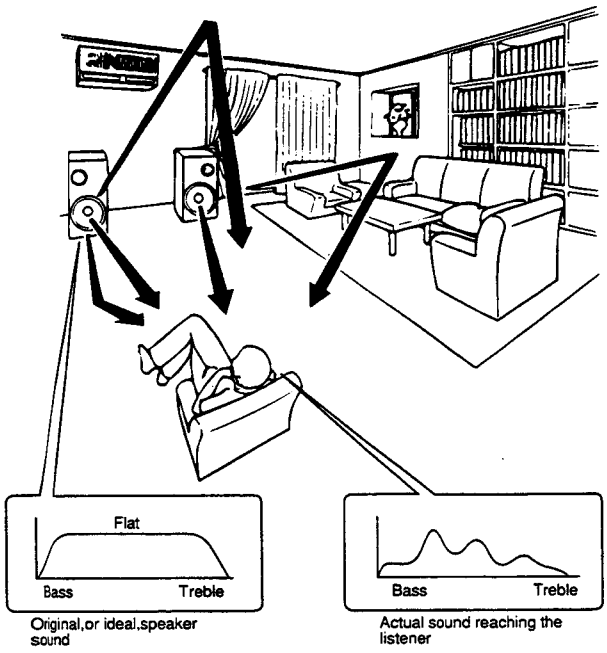
ACTIVE N.B. circuit

Automatically compensates the amount of bass appropiate to the content of the music played. The following three modes are available.

① ANB 1: Bass varies automatically every 1.6 seconds.
② ANB 2: Bass varies automatically every 8 seconds.
③ ANB 3: Bass varies automatically every 16 second.

ANB 1 is suitable for tunes in which the bass varies at short intervals. Select ANB 2 or ANB 3 as the variation interval lengthens. The above description serves only as reference. Please play sound in various modes and select the one that suits your taste best.

Functions of graphic equalizer



Compensation for the audio characteristics of the listening room

The listening room may contain several objects. Some of them reflect sound and some absorb sound. thus the sound reaching your ears is considerably affected by these objects. In such cases, the graphic equalizer can be used to adjust the frequency response of the room for a flat response from low to high frequencies.

- Low frequencies are absorbed by beds, chairs, etc.
- High frequencies are absorbed by curtains, screens, etc.
- The room structure can cause the low frequencies to be unclear, or the sound level to increase or decrease depending on the frequency.

Adjustment of sound to your individual taste

When the reproduced sound contains several musical instruments and voices, the graphic equalizer allows you to enhance or attenuate the sound of specific instruments or voices.

Sound equalization

- **Super bass range (40 Hz~63 Hz)**
  When this control is moved up, the bass instrument (double bass, bass drums, or pipe organ, etc.) sound is increased. When the super bass sound is boomy, move this control down.
- **Bass range (96 Hz~160 Hz)**
  Usually, the listening room resonant frequency is in this range.
  To eliminate bass resonance, move this control down.
- **Mid-bass range (250 Hz~400 Hz)**
  This range is the basis of music. Whether the sound is rich or not, depends on this range. When the playback sound is not so good, move this control up.
- **Mid range (625 Hz~1 kHz)**
  When this control is moved up or down, the baritone or soprano voice is emphasized/de-emphasized. This range is related to the "presence" of music.
- **Mid-high range (1.5 kHz~2.5 kHz)**
  This range is related to stimulus and metallic sound. When this range is well compensated, vivid sound can be obtained.
- **High range (3.9 kHz~6.3 kHz)**
  This frequency range is related to the hardness of the sound. when this control is moved up, strings or brass instruments, such as flutes or piccolos, are emphasized. When the control is moved down, the sound will be more soothing.
- **Super high range (10 kHz~16 kHz)**
  This frequency range is related to the details of the music. When this control is moved up, super high frequency instruments, such as triangles or cymbals, are emphasized, resulting in wide sound and echoes.

Surround modes and presence modes

This system incorporates the following Surround functions which can provide the feeling of presence in a concert hall or theater or the powerful effects of theater movies recorded with Dolby Surround audio. For details, refer to each operation procedure on the following pages. For the detail settings, use the Remote control unit of main system (RC-97M, RC-97LD).

Surround modes and presence modes

PRESENCE

The presence effect can reproduce presence sound fields in seven modes (six modes for the U.K. and Europe) (Arena, Jazz Club, Stadium, Discotheque, Game, Movie, KARAOKE (except for the U.K. and Europe)).
The presence effect can be further enhanced by connecting optional Surround rear speakers or omnidirectional speakers.

F.2ch
Select this mode when only two speakers are connected. Seven (Six) kinds of presence effects can be reproduced. (See Fig. 6)

F.4ch
Select this mode when the optional omnidirectional speakers are connected. Seven (Six) kinds of presence effects can be reproduced similarly to F.2ch. The LINEAR ACOUSTIC control knob on the amplifier (A-87, A-97) is set automatically according to the selected sound field. (See Fig. 5)

S.4ch
Select this mode when the optional omnidirectional speakers and optional surround rear speakers are connected. Seven (Six) kind of presence effects can be reproduced similarly to F.4ch and F.2ch. (see Fig.4)

AI LINK equalizer effect
When the presence effect is turned ON, an equalizer pattern matching the presence sound field is created automatically to enhance the presence effect.

ASFC (Acoustic Surround Field Control)
The expansion of sound can be controlled in 5 steps, allowing to obtain a presence effect that matches the taste of the listener. (Refer to page 25.)

DOLBY PRO LOGIC SURROUND

When optional surround rear speakers are connected and video software tape or LD software disc marked DOLBY SURROUND is played, a Dolby Surround effect similar to movie theaters can be enjoyed. (See Fig. 1 and 2.)

DOLBY 3 STEREO

Select this when the surround rear speakers are not used. This improves the positioning of the center sound. (See Fig. 3.)

PRESENCE REC

When recording music on a tape, the presence effect can be recorded in stereo. This makes it possible to enjoy the presence sound through a headphone stereo or car stereo.

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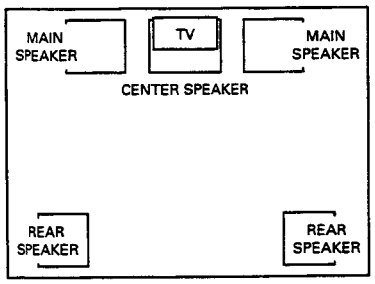
When the presence and Dolby Surround modes are ON, the sound from the rear speaker (optional) does not stop even when the speaker switch on the amplifier is set to OFF.

■ Speaker layout

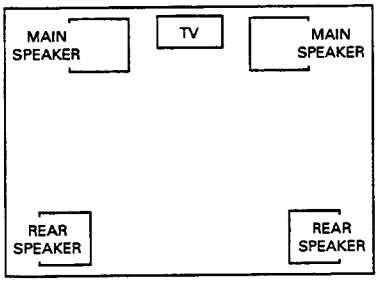
DOLBY PRO LOGIC mode
(NORMAL, WIDE)
Standard layout

Fig. 1



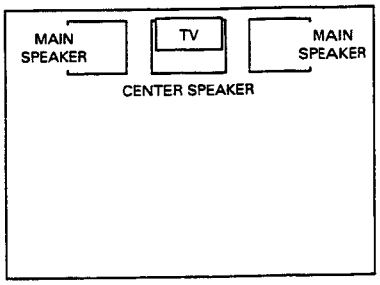
DOLBY PRO LOGIC mode
(PHANTOM)
When the center speaker is not used

Fig. 2



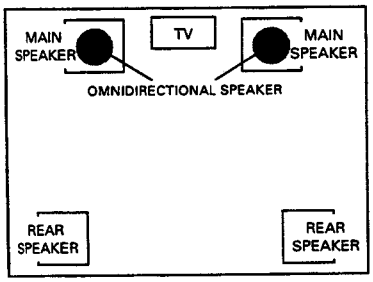
DOLBY 3 STEREO mode
When the surround rear speakers are not used

Fig. 3



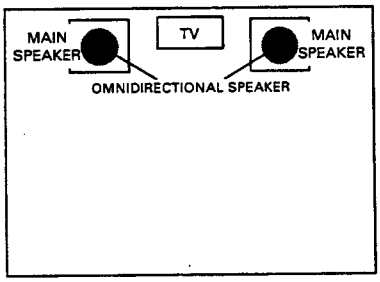
DSP S.4ch mode

Fig. 4



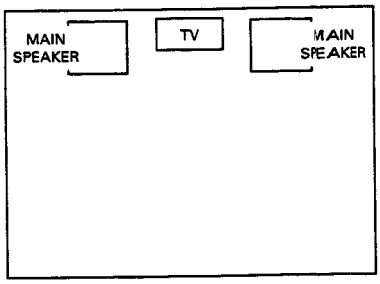
DSP F.4ch mode

Fig. 5



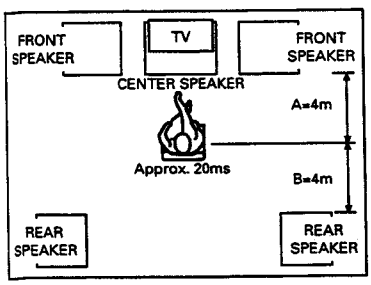
DSP F.2ch mode
When only two speakers are used

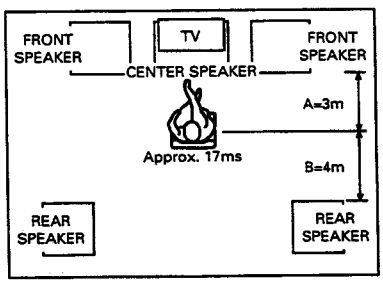
Fig. 6

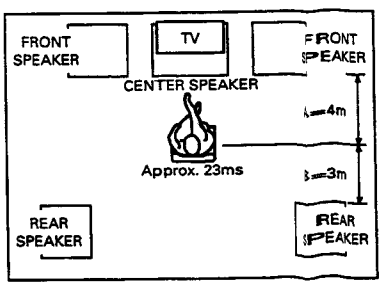


Setting the Delay time DOLBY PRO LOGIC SURROUND only

The delay time should be adjusted according to the difference between the distance from the listening position to the front speakers and the distance to the rear (surround) speakers. Determine the appropriate delay time using the formula shown below.
Relationship between the position of the rear (surround) speakers and the delay time at the listening position:
Delay time = 20 ms + 3 ms × (A – B) m







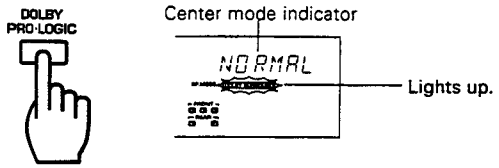
DOLBY SURROUND

When video software carrying DOLBY SURROUND mark is played, this mode provides the similar Dolby Surround effect to movie theaters.

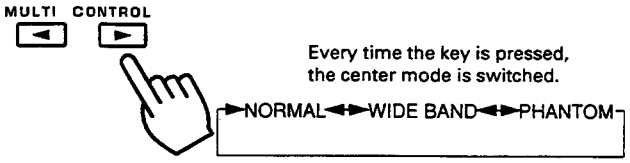
■ Dolby Surround field adjustment

Remote control unit only

1 Set the Dolby Surround mode.



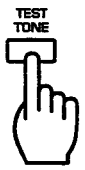
2 Select the center mode.



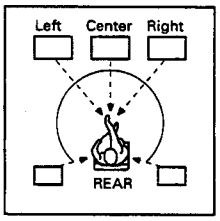
- Refer to column "Center mode" below.

3 Adjust the volume balance.

① Press the TEST TONE key.



Noise-like test tone moves across the speakers every 1.5 seconds.



In NORMAL or WIDE BAND mode:

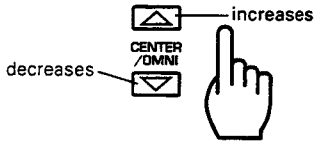
Left → Center → Right → Rear

In PHANTOM mode:

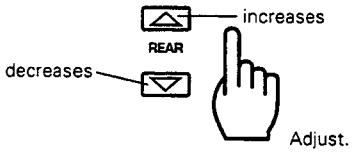
Left → Right → Rear

② Adjust the volume balance.

Adjust the center level.

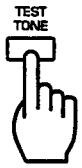


Adjust the rear level.

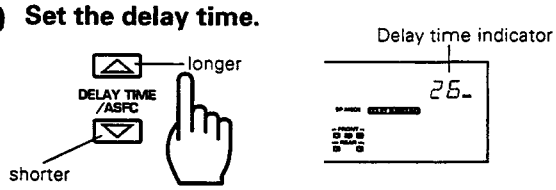


- Adjust so that the test tone volumes are the same on all speakers.
- The level being adjusted is displayed.
- The adjustment range is from –30 to +10 dB.
- The center speaker level is stored in memory as the common setting with "Dolby 3 Stereo" and the rear level is stored as the common setting with "S.4ch".

4 Stop generating the test tone.



5 Set the delay time.



- Refer to the formula shown on page 19.
- The delay time can be adjusted in the range from 16 to 30 ms.
- When one of the DELAY TIME/ASFC key is pressed, the delay time is displayed and varied in 2 ms steps per press the key.
- Once a delay time is set, it is automatically held in memory so the same delay time is displayed whenever Dolby Surround is switched ON later.

Center mode

Select one of the following center modes according to the type of the presence speakers in your system.

NORMAL: Use this mode with a center speaker of a compact size.
WIDE BAND: Use this mode with a center speaker of a medium or larger size.

- If you cannot identify whether your center speaker is of the medium or compact size, try both the NORMAL and WIDE BAND mode and use the one that can provide better sound positioning.

PHANTOM: Use this mode when the center speaker is not used.

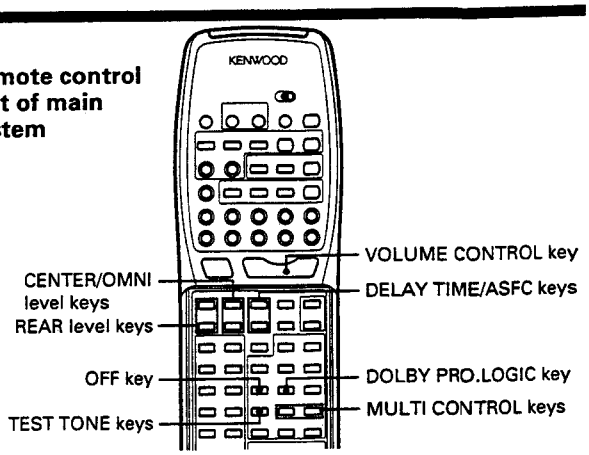
- Even without the center speaker, the signal is processed in a simulated manner to ensure proper center image positioning and provide the enjoyment of Dolby Surround.

■ Operation of Dolby Surround playback

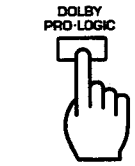
When video software carrying DOLBY SURROUND mark is played, this mode provides the similar Dolby Surround effect to movie theaters.

Before using the Dolby Surround mode, be sure to perform the "Dolby Surround field adjustment" procedure.

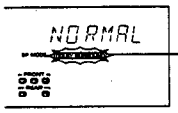
Remote control unit of main system



1 Set the Dolby Surround mode.

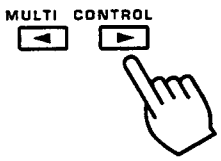


Remote control unit



Lights up.

2 Select the center mode.



Remote control unit

NORMAL ⇔ WIDE BAND ⇔ PHANTOM

- Normally, the last mode used is held in memory If it is different from the required mode, select the mode which was used in step 2 of the "Dolby Surround field adjustment" (page 20).

3 Play a software program encoded with Dolby Surround.

- For this unit, input balance is adjusted automatically.

4 Adjust the volume.

Adjusts the overall volume.

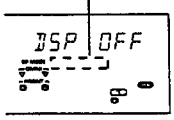
Remote control unit

- When center and rear speakers is not well balanced, perform the "Dolby Surround field adjustment" procedure again.

To return to normal stereo playback

Remote control unit

Goes off.



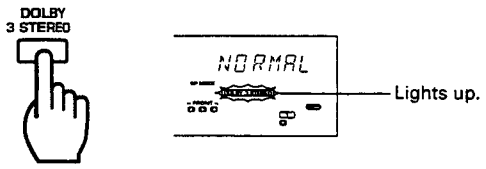
DOLBY 3 STEREO

The Dolby 3 STEREO provides a active center channel to produce a better, stable center image. This mode can be used when listening to stereo video program and music or when surround listening or surround system set-up is not possible.

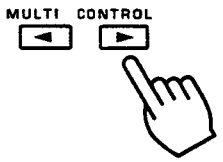
■ Dolby 3 STEREO adjustment

Remote control unit only

1 Set the Dolby 3 STEREO mode.



2 Select the center mode.



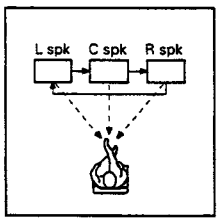
Every time the key is pressed, the center mode is switched.

NORMAL◄►WIDE BAND

- Set the center mode to NORMAL if using a small center speaker, or set to WIDE BAND if using a medium-sized or larger speaker.

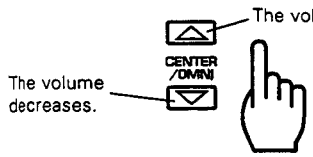
3 Adjust the center speaker volume.

① **Press the TEST TONE key.**



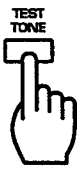
Noise-like test tone moves across the speakers every 1.5 seconds.

② **Adjust the volume.**
Adjust the center level.

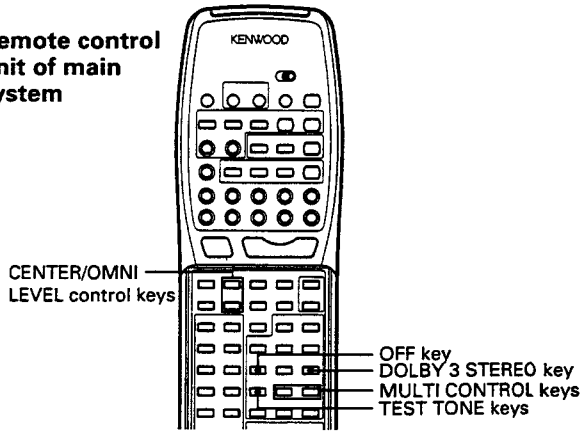


- Adjust so that the level of the center speaker is equal to that of the left and right speakers.
- The adjustment range is from –30 to +10 dB.
- The center speaker level is stored in memory as the common setting with "Dolby Surround".

4 Stop generating the test tone.



Remote control unit of main system

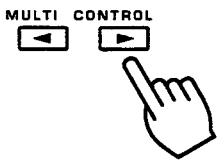


■ Dolby 3 STEREO playback

1 Set the Dolby 3 STEREO mode.

Remote control unit

2 Check the center mode.



NORMAL◄►WIDE BAND

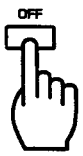
Remote control unit

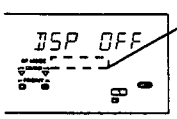
- Set the center mode to NORMAL if using a small center speaker, or set to WIDE BAND if using a medium-sized or larger speaker.

3 Play a stereo software program or a Dolby surround program.

4 Adjust the volume and tone.

To return to normal stereo playback

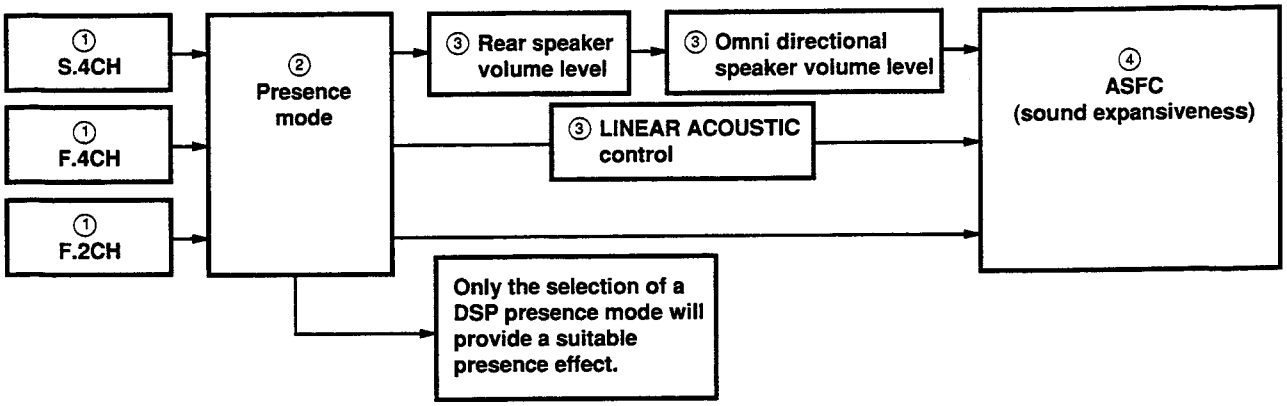




Remote control unit

Presence

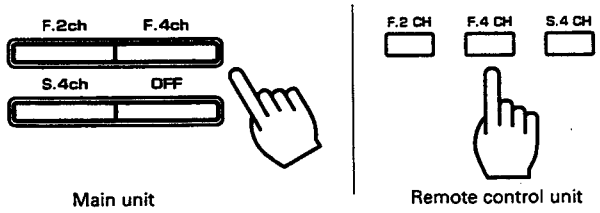
The DSP (Digital Signal Processor) makes it possible to enjoy the ambiences of various places where music is played. The DSP has seven basic presence parameters which can be set individually.


① S.4CH
① F.4CH
① F.2CH
② Presence mode
③ Rear speaker volume level
③ Omni directional speaker volume level
③ LINEAR ACOUSTIC control
④ ASFC (sound expansiveness)
Only the selection of a DSP presence mode will provide a suitable presence effect.

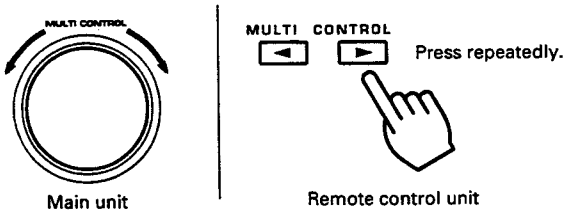
■ Presence playback

Play a music source.

1 Select the Surround mode.



2 Select the presence mode.



The modes are switched over as shown below.

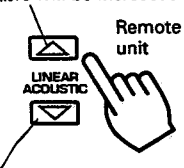
ARENA ↔ JAZZ CLUB ↔ STADIUM
↕ ↕
KARAOKE ↔ MOVIE ↔ GAME ↔ DISCOTHEQUE
(Except for the U.K and Europe)

- The LINEAR ACOUSTIC control knob of the amplifier (A-87, A-97) is set automatically according to the selected sound field.
- For the types and effects of the presence mode, please refer to page 25.

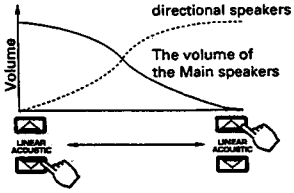
3 Adjust the volume balance.

F.4ch mode

The sound from the omnidirectional speakers will be increased.

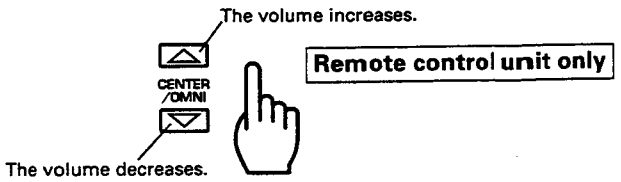


The sound from the omnidirectional speakers will be decreased.

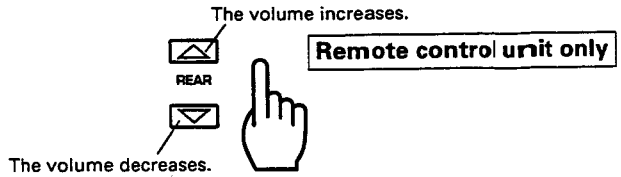


S.4ch mode

① Adjust the omnidirectional speaker volume.

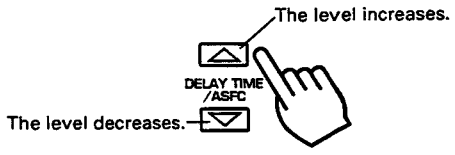


② Adjust the rear speaker volume.



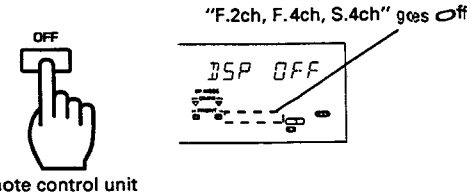
4 Adjust the sound expansiveness.

Ajust to create a desired sound field.

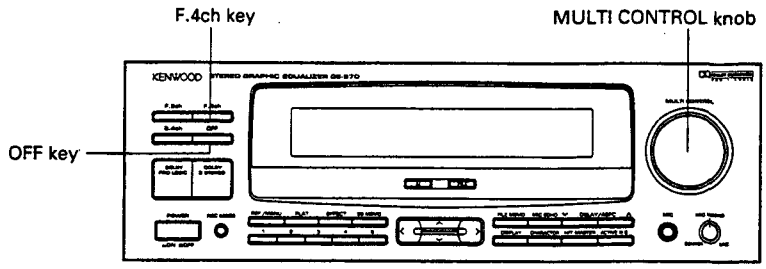


- The level is variable in the range from 1 to 5.

To cancel the presence effect

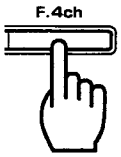


- Be sure to turn the presence effect off when presence playback is not required.

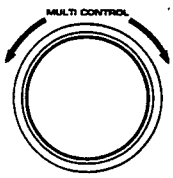


■ Combination of presence and environmental sound (F.4ch only)

1 Select the F.4CH mode.



2 Select the sound field.



ARENA ↔ JAZZ CLUB ↔ STADIUM
↕ ↕
KARAOKE ↔ MOVIE ↔ GAME ↔ DISCOTHEQUE

- For the contents of the sound fields, refer to page 25.
- The LINEAR ACOUSTIC control knob of the amplifier is set automatically according to the selected sound field.

3 Switch the DUAL SOUND ON.

Select the environmental sound volume.

Remote control unit

Each press changes the volume as follows.

LEVEL1 (Low) → LEVEL2 (Medium) → LEVEL3 (High) → OFF (DUAL SOUND OFF) → LEVEL1

4 Play an environmental sound.

① **Select the OMNI input.**

Remote control unit

Each press switches the input as follows.

CD/LD → TAPE → MD/DAT → AV AUX → CD/LD

② **Play the selected source.**

5 Play the music.

① **Select the MAIN input.**

Remote control unit

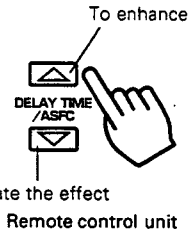
Switches the input as follows.

TUNER → PHONO → CD/LD → VIDEO → AV AUX → MD/DAT → TAPE A → TAPE B → TUNER

② **Play the selected input source.**

6 Adjust the sound expansion (ASFC)

Adjust the sound expansion as desired.



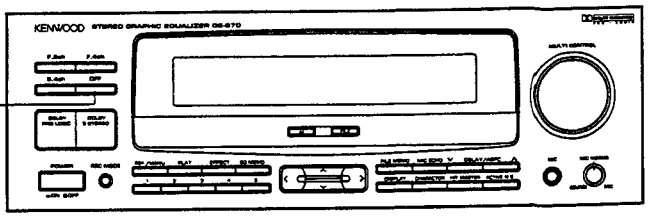
Remote control unit

- The ASFC key allows to adjust the sound expansion in 5 steps. The sound expands as the adjusted level increases the normal level is 3).

To end the presence play

① **To cancel the DSP presence mode**
.....Press the OFF key.

② **To cancel the environmental sound**
.....Press the DUAL SOUND key so that the "DUAL SOUND" indicator goes off.



■ To turn presence effect OFF

Press the OFF key.

• Be sure to turn the presence effect OFF when it is not required.

■ To record with presence effect

1 Select a presence sound field.

2 Select an input source.

3 Play music and start recording.

• Set the recording level using CCRS.

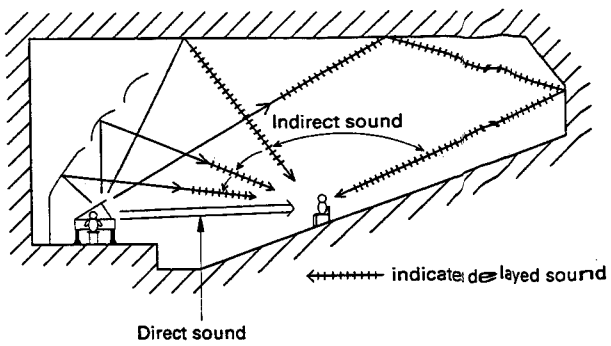
Note:
The Dolby Surround effect cannot be applied to the sound to be recorded.

Types and results of presence modes

ARENA	Reproduces the sound field of a hall with many high-frequency reflections and long reverberation period.
JAZZ CLUB	Reproduces a jazz house where the sound of cymbals echoes.
STADIUM	Reproduces the ambience of reflections similar to sport stadiums by simulating the sound of PA speakers.
DISCO-THEQUE	Reproduces the feeling of a disco with exciting middle- and high-frequency sounds through the use of moderate reverberation and a graphic equalizer.
GAME	Enhances the sound effect of video games to reproduce powerful sound with an atmosphere of presence.
MOVIE	Reproduces the delay sound and a "live" atmosphere of a movie theater.
KARAOKE	Reproduces the sound effect of echoes.

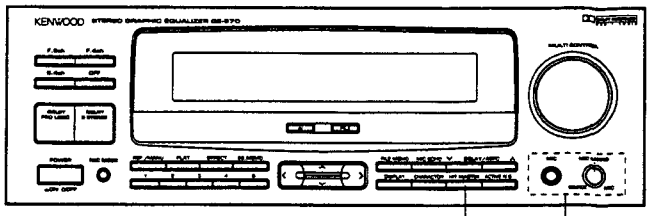
ASFC (Acoustic Surround Field Control)

As shown in the illustration, the sound of a piano played on the stage of a concert hall attains the listener as the indirect sound reflected a few times by the reflector plates, ceiling, walls and back wall and the reverberation sound generated by infinite reflections as well as the direct sound from the piano to the listener.
(The indirect sound is always delayed with respect to the direct sound.)
The delay time refers to the period between the arrival of direct sound and that of indirect sound, and the reverberation level (presence) refers to the magnitude of the indirect and reverberation sound.
In this way, the indirect sound with delay is an important element of the comfortable acoustic effects and the feeling of presence in a concert hall.
The ASFC provides a selection of five kinds of combinations of delay times and indirect sounds (reverberation sounds) to allow simple acoustic field adjustment.
As the acoustic field also varies depending on the layout of speakers, try various settings to create the optimum sound field.



Let's sing

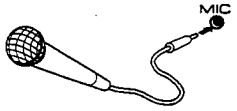
You can enjoy singing along with music using a regular music tape or CD.



■ Regular MIC MIXING (Except for the U.K. and Europe)

Match the mic sound with the music source so you can sing a duet with your favorite singer.

1 **Connect the microphone.**



2 **Select an input source of the amplifier.**

3 **Set the DSP presence mode to "KARAOKE".**

• Refer to page 23.

4 **Play the music.**

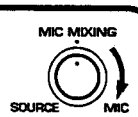
5 **Sing together with the music piece.**

6 **Adjust the mic sound volume.**

The audio input thorough the microphone is not displayed on the spectrum analyzer display.

When using the microphone only.

Stop the music and set the MIC MIXING knob to the right side.

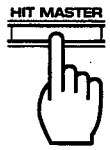


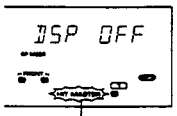
■ Using HIT MASTER

The vocal parts of the music piece are muted out so that you become the leading singer.

1 **Select an input source of the amplifier.**

2 **Set the HIT MASTER to ON.**





Lights up.

Each press changes the functions. HIT MASTER ⟷ OFF

- When the DSP presence mode in OFF, set the LINEAR ACOUSTIC control of the amplifier (A-97 or A-87) to the fully MAIN side.

3 **Play the music.**

Note:
Depending on the music source, it might not be possible to erase the vocal parts.

Karaoke with HIT MASTER (Except for the U.K. and Europe)

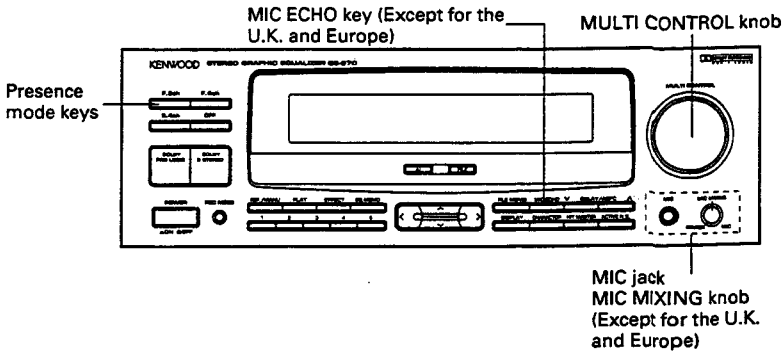
① Set the DSP presence mode to "KARAOKE".

② Connect the microphone.

③ Use the procedures of "Using HIT MASTER".

④ Sing together with the music piece.

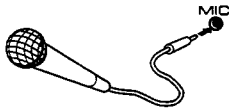
⑤ Adjust the mic sound volume.


MIC ECHO key (Except for the U.K. and Europe)
MULTI CONTROL knob
Presence mode keys
MIC jack
MIC MIXING knob (Except for the U.K. and Europe)

■ Singing with echo (Except for the U.K. and Europe)

When the DSP presence mode is KARAOKE, an echo effect can be applied to the sound of the connected microphone.

1 **Connect the microphone.**



2 **Select an input source of the amplifier.**

3 **Set the DSP presence mode to "KARAOKE".**

- Refer to page 23.

4 **Play the music.**

5 **Sing together with the music.**

6 **Adjust the ECHO level of the mic.**
Each press changes the level, and the depth of effect will be enhanced.

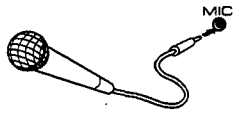
① ECHO 1
② ECHO 2
③ ECHO 3
④ KARAOKE (Echo OFF).

7 **Adjust the mic sound volume.**

■ Song Recording (Except for the U.K. and Europe)

Record your own voice with the original orchestra in the background.

1 **Connect the microphone.**



2 **Select an input source of the amplifier.**

3 **Execute steps for "Ordinary recording" up to step 5.**

- Refer to the Instruction Manual of the main system.

4 **Adjust the mic sound volume.**

- Select the HIT MASTER function as required.

5 **Start recording.**

6 **Play the music.**

7 **Sing together with the music piece.**

8 **Stop recording.**

In case of difficulty

⚠ **Caution: Read this page carefully to ensure safe operation.**

What appears to be a malfunction may not always be serious. If your unit should not perform as expected, consult the table below to see if the problem can be corrected before seeking help from your dealer or service representaive.

Symptom	Cause	Remedy
Power fails to turn on.	• Poor connection of the power cord plug. • The power cord plug is connected to the SWITCHED outlet of the amplifier, and the power switch is turned off.	• Connect the power cord plug securely. • Turn on the power switch of the amplifier.
Sound is not output.	• The input and output connections are reversed.	• Connect the input and output correctly.

Notes:
1. As this unit is microprocessor-controlled, malfunction may occur due to external noise or interference. In such a case,, unplug the power cord from the power outlet and then, while holding the EQ. MEMO key depressed, plug the power cord again to the power outlet.(This clears the memory.)
2. Do not use contact cleaners because they could cause a malfunction. Be especially careful against contact cleaners containing oil, for they may deform the plastic components.

Memory backup
Even if the power is off. The memory contents will be backed up for about three days.

Specifications

Performance

Equalizer characteristic variable range ..... **±12 dB**
Center frequencies (Hz) **40, 63, 98, 160, 250, 400, 625, 1k, 1.5k, 2.5k, 3.9k, 6.3k, 10k, 16k**
Frequency response ..... **10Hz~70kHz, ±3dB**

Total harmonic distortion (at 1 kHz, flat) ..... **0.06 %**
Gain ..... **0 dB**
Signal to noise ratio (IHF'66) ..... **100 dB**
Input impedance ..... **47 kΩ**
Output impedance ..... **2.2 kΩ**

General

Power consumption **30W**
AC outlet
For Australia
UNSWITCHED ..... **1 (100W max.)**
For other countries
UNSWITCHED ..... **2 (100W max.)**
Dimensions ..... **W: 360 mm**
H: 120 mm
D: 357 mm
Weight (Net) ..... **4.2 kg**

Note:
KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.